

Serpukhov College

Group Essay Contest

# “Unity in Diversity: Russia and the English-Speaking World. Time for Equal Opportunities”

Research work (essay)

## The development of online education: from Charles Babbage’s invention of a prototype computer to the present

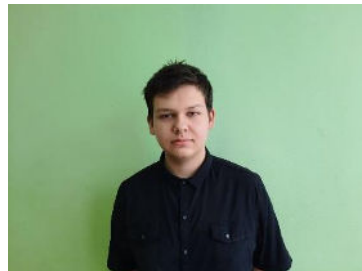
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theme of the project



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Serpukhov

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## **Тезисный план**

1. Вступление
2. Чарльз Бэббидж и его изобретения.
3. Технологии наших дней.
  - 3.1 Кто продвигал отрасль?
  - 3.2 Насколько далеко ушли технологии от дней Чарльза Бэббиджа?
  - 3.3 Какие возможности нам дают современные технологии?
4. Что такое онлайн образование?
  - 4.1 История развития.
  - 4.2 Насколько актуально сейчас онлайн образование?
  - 4.3 Онлайн-образование в перспективе.
  - 4.4 Почему за онлайн образованием будущее?
  - 4.5 Плюсы онлайн образования.
  - 4.6 Минусы онлайн образования.

## **Theses**

1. Introduction.
2. Charles Babbage and his inventions.
3. Technologies of the present day.
  - 3.1. Who promoted the industry?
  - 3.2. How far has technology gone from Charles Babbage's days?
  - 3.3. What opportunities do modern technologies provide?
4. What is online education?
  - 4.1. History of development.
  - 4.2. How relevant is it now?
  - 4.3. Online education in perspective.
  - 4.4. Why online education is the future of education?
  - 4.5. Pros of online education.
  - 4.6. Cons of online education.

In our essay we would like to speculate on online education and its development, to find out where it all began and how it has endured and existed up to the present day, and to pay tribute of respect to those people, mathematicians, engineers and scientists without whom online education wouldn't be possible.

First of all, we should remember Charles Babbage, a pioneer of using the computing technologies. He was a British mathematician of the 18-19<sup>th</sup> centuries and an inventor of the first analytical computing machine. When creating a computing machine, he was driven by educational motives as being a student he used to make a lot of mistakes in complex calculations (that by coincidence is quite in context of our research educational agenda). His difference engine was based on the finite difference method. The machine was completely mechanical and consisted of many gears and levers. It used a decimal number system, operated with 18-bit numbers with an accuracy of the eighth decimal place and provided a speed of calculation of 12 sequence terms per minute. The small difference engine could count the values of the 7<sup>th</sup> degree polynomials. In 1833 Babbage began creating a programmable computer, he called it the analytical engine. It is was the prototype of the modern computer and consisted of the following parts: a store, a factory or a mill, a control element and information input-output devices. Charles Babbage was followed by many scientists who promoted the information technology industry.

One of them is Alan Turing who created an analytical engine. His invention made it possible to “do various things just by programming, not by adding additional hardware”. The next was Claude Elwood Shannon who contributed by founding a new branch of computer science – information theory. It describes the best ways to encode information that the sender wants to share. We can't but mention Konrad Zuse and Howard Aiken, the scientists who contributed to the development of the hardware. Konrad developed the world's first functional software-controlled computer in 1941, and Howard in 1944. It was the first

generation of computers. The next generations of computers have been focused on increasing power and reducing size. We owe the creation of communication tools to such scientists as Paul Baran, who developed the project of the distributed network, as well as Donald Davis.

The present day technologies have become more developed and affordable to ordinary people. They give us many opportunities including online education.

In online education educational instructions are delivered via the Internet to students who use their home computers. During the last decade, online degrees and courses have become popular alternative for a wide range of nontraditional students, including those who want to continue working full-time or raising families. Most of the time, online degree programs and courses are offered via the host school's online learning platform, although some are delivered using alternative technologies. Although there are subtle dissimilarities, the main difference between online and traditional learning is the fact that online education liberates a student from the usual trappings of on-campus degree programs – including driving to school, planning their schedule around classes, and being physically present for each sequence of their coursework.

If this sounds drastic, it really isn't. "The truth is that the education methods and materials provided in online degree programs are often the same as those provided for on-campus programs." – said Robert Monroe, Director of the Online Hybrid MBA at Carnegie Mellon University's.

The Internet takes its first wobbly steps in the late 1960-s and early 1970-s years. This era is marked by many "firsts," including the invention of packet switching, ASCII coding, the term "Internet," the launch of ARPANET, and of course, the first Internet signal – "LO" (attempting the word "LOGIN"). Most of the technology developed in this period has been retired, antiquated by the natural evolution of technology. It was a period of rapid and remarkable breakthrough, which highlighted the prospects of a worldwide computer

network, as well as the first virtual campus, though we were still a few years away from online education.

Even though Internet-type signals had been transmitted from school to school in decades past, the 1980-s are the birth years of modern Internet. Before this era, the Internet and online education were just research experiments. The vision for the Internet was primarily based in university computer labs. But online education does find its earliest entrants in the 1980-s with the first online college courses and online degrees as distance education embrace the idea of online learning. During this era, the Internet reaches Europe and Asia. Infrastructure is laid down, providing for faster and more expansive Internet operations and effectively opening the door for the total commercial and popular permeation of web use in the decade that would immediately follow.

With the advent of online learning, more people than ever before are able to connect, learn, and grow on their own terms, without many of the obstacles that are associated with traditional, on-campus education. While online colleges may never totally replace the traditional ones, it is undeniable that online education has had a major impact not only on how we pursue formal education, but on how we teach, learn, and perceive knowledge. The future of online education is strong indeed and there are many changes you are likely to see.

As more and more individuals seek online education, there is a growing need to follow a universal standard of quality. Presently, online programs do follow some standards, but the level of academic quality and strictness differ from instructor to instructor and from school to school. Consistency is what every student seeks, and this is what the future of online education will allow them to enjoy. Online education can be as effective as the brick-and-mortar schools if not more. It is an instructor who has the biggest role in determining the success of the students. However, most professionals feel that the future of online education will make their role narrower as technology will have a greater role to play. The fact is that technology never can completely replace an

instructor, even in online schools. Improvement in technology will only offer the instructors better way to teach their students which will ultimately prove their benefit for the teacher as well as the students.

With the growth in online education, the requirement of tech-savvy instructors can certainly increase. These instructors will use technology as much as possible to change the way the students are taught and to benefit the students in the best possible way.

Teacher-to-teacher and student-to-student collaboration tools are already being used and they have indeed made a big impact on online education. Various tools like ezTalks video conferencing software, blogs, wikis, user-generated content, and social networking is changing the way online institutions are teaching students. The changes include students collaborating online to complete group projects, professors teaching in various mediums, eBooks replacing printed textbooks, and so on.

Most systems are already offering different types of video conferencing tools, helping students enjoy new opportunities in a more flexible and accessible environment. The learning systems will eventually transform from an educational platforms to the environment that actually helps students grow, and will be immensely beneficial for the students in the long run.

The future of education is online education, and it is a bright future. More and more institutions will start emerging, and the kind of education they provide will help create a brighter future for the students. So, if you plan to continue your education, online institutions will prove to be your best bet. However, just make sure to choose an institution wisely. Opt for one that is well-known, offers the kind of course you are interested in, and a degree that will be accepted by the employers you wish to join. If all these seem to be okay, your future, together with the future of online education is indeed very bright.

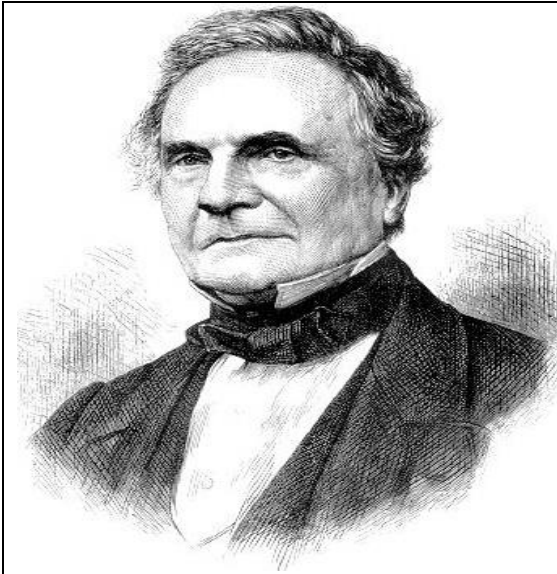
In conclusion, we can say that online education is the future and it will develop, because a lot of benefits can be derived from this.

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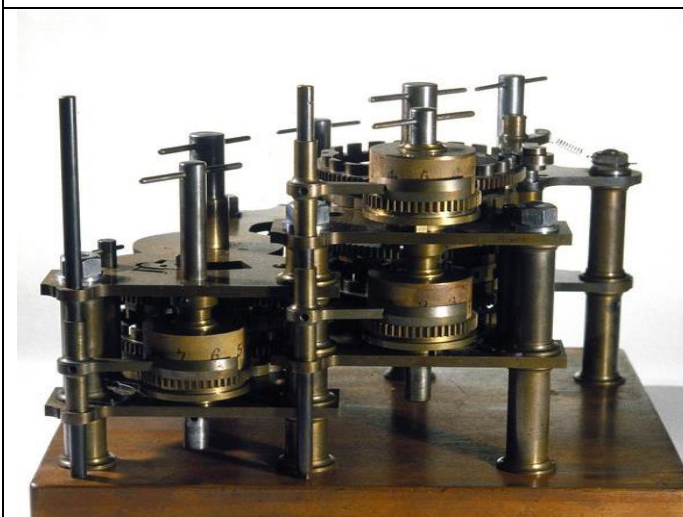
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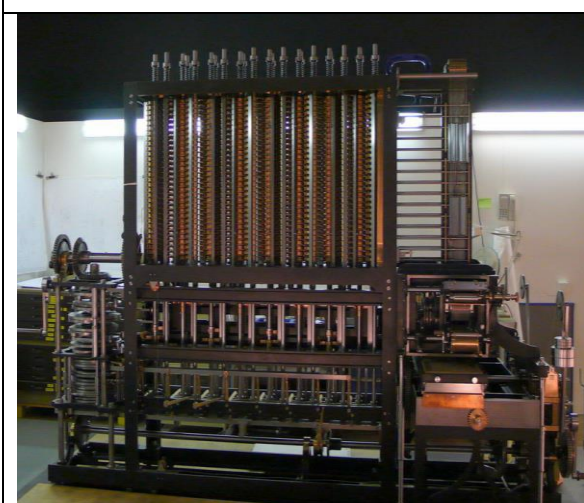
## Appendix



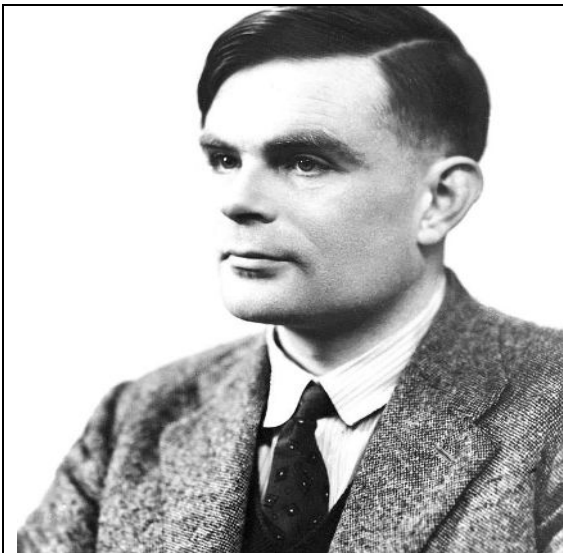
**Charles Babbage**



**Charles Babbage's Small  
Difference Engine**



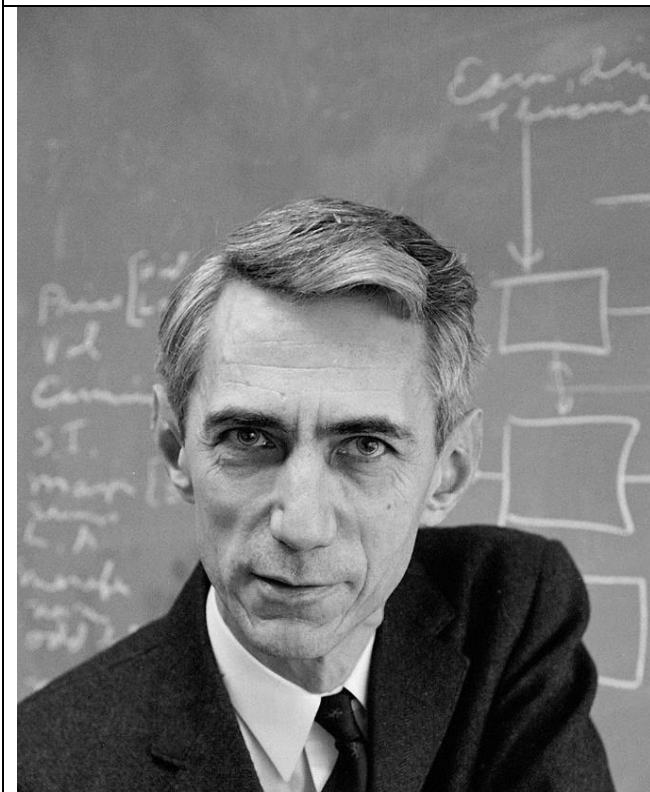
**Charles Babbage's Analytical  
Engine**



**Alan Turing**



**Alan Turing's Analytical Engine**

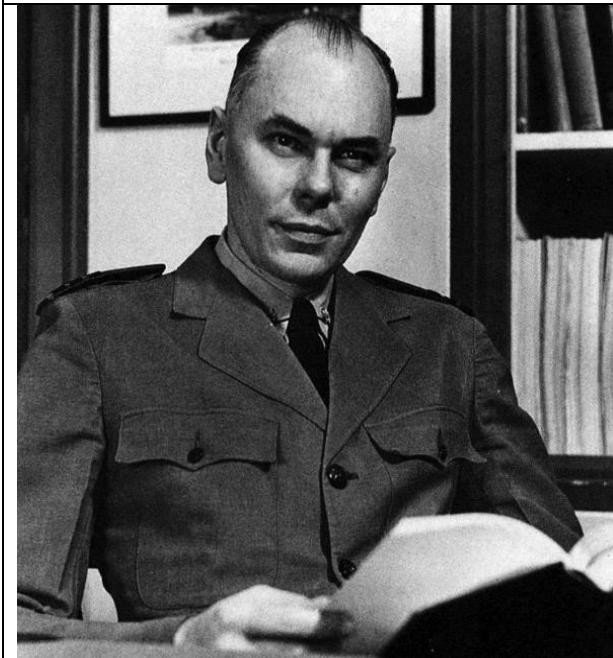


**Claude Shannon**  
**(1916-2001)**



**Konrad Zuse**

**(1910-1995)**



**Howard Aiken**

**(1900-1973)**